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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,195	07/25/2001	James A. Davis	B-4259 618973-9	5296
7590	05/07/2004		EXAMINER	
HEWLETT-PACKARD COMPANY Intellectual Property Administration P.O. Box 272400 Fort Collins, CO 80527-2400			ABRAHAM, ESAW T	
			ART UNIT	PAPER NUMBER
			2133	10
DATE MAILED: 05/07/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	09/915,195	DAVIS ET AL.	
	Examiner	Art Unit	
	Esaw T Abraham	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 25 July 2001.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-71 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date # <u>4,8, and 9</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. Claims **1 to 71** are presented for examination.

2. The examiner considers the preliminary amendment filed on 05/28/02.

Information Disclosure Statement

3. The examiner has been considered the references listed in the information disclosure statement (see attached PTO-1449).

Specification

4. The **abstract** of the disclosure is objected to minor spelling error. For example: please correct the word “minimise” to “minimize” in line 13 of the abstract. Correction is required. See MPEP § 608.01(b).

Claim objections

5. Claim 77 is objected to because of the following informalities: Claim 77 is not a proper or complete dependent claim because it does not include any limitation or have any structural relation with claim 39.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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6. Claims **8, 15, 46 and 53**, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to claims 8, 15, 46 and 53 the phrase “**at least substantial portion**” renders the claim indefinite because it is unclear to the examiner what portion of the block of ECC is considered to be substantial. The examiner would appreciate if the applicant would clarify this matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims **1-77** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rotker et al. (U.S. PN: 5,263,030).

As per claim **1 and 39**, Rotker et al. teach or disclose error correction techniques for coding data for storage on magnetic tape (see col. 1, lines 6-9). Rotker et al. teach an encoding system for storing data on a tape interleaves and encodes “b” multi-symbol data blocks as they are being sent to the tape for storage, using a $(b+k, k)$ error correction code to generate k multi-symbol ECC blocks then records the k ECC blocks and further before the system records the data blocks store them along with ECC blocks in a buffer and a matrix with the data blocks stored in rows (see col. 2, lines 12-30 and abstract). Furthermore, Rotker et al. teach that the buffer is a DRAM (dynamic random memory), which stores data blocks in rows and columns (see col. 6, lines 29-40). Rotker et al. **do not explicitly** teach the invention as detailed above except the storage device as “magnetoresistive storage device (MRAM)”. However, magnetoresistive storage device are well known with the level of ordinary skill in the art. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to ensure the memory device is capable of representing different RAM memories. This modification would have been obvious because a person having ordinary skill in the art would have been motivated to employ various types of RAM memories for storing data and ECC codes to ensure all the data are stored.

As per claims **2-4 and 40-42**, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including a buffer (DRAM) (see fig. 1, element 13) is schematically arranged as a matrix with the data blocks stored in rows and includes 4 rows, schematically arranged beneath the data rows, for the storage of 4 multi-symbol ECC blocks (see col. 3, lines 58-64).

As per claims **5, 14-16 and 43-47**, Rotker et al. teach all the subject matter claimed in claims 1 and 39. Rotker et al. **do not explicitly teach** that each symbol is readable by taking a

slice from each row. However, the practice is known in the art and commonly used by most of memory systems. Therefore, it would have been obvious to a person having an ordinary skill in the art at the time the invention was made to read a portion of data (slice) from a memory system depending the designer's choice of designing the size of readable data. This modification would have been obvious because a person having ordinary skill in the art would have been motivated to do so because reading a pre-designed size of data (slice) from a memory system are well known in the art.

As per claim 6, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including a data encoding and recording system for encoding a set of multi-symbol data blocks in accordance with an error correction code to generate multi-symbol blocks of error correction residue symbols and recording (storing) the data and residue symbols on a magnetic tape (see claim 1).

As per claim 7, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including a data encoding and recording system for encoding a set of multi-symbol data blocks in accordance with an error correction code to generate multi-symbol blocks of error correction residue symbols and recording (storing) the data and residue symbols on a magnetic tape (see claim 1). Further, Rotker et al. teach data blocks stored along with ECC blocks in a buffer, schematically a matrix with the data blocks stored in rows and the ECC blocks arranged beneath the data and the buffer thus schematically aligns the corresponding symbols of the data blocks and ECC blocks in columns (see col. 2, lines 22-30).

As per claims 8-10, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including the system retrieves (read from the memory) the preliminary ECC symbols from the

first storage location of each of the ECC blocks, schematically the symbols in the first column of the buffer rows assigned to the ECC blocks, and uses them to initialize an ECC encoder (see col. 31-39).

As per claims **11-13 and 48-54**, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including Rotker et al. teach that the system (10) receives blocks of data and stores the data in a buffer (13) whereby the buffer is schematically arranged as a matrix (array) with the data blocks stored in rows and further, the buffer includes 4 rows, schematically arranged beneath the data rows, for the storage of 4 multi-symbol ECC blocks (see col. 3, lines 59-64). Furthermore, the buffer aligns the corresponding symbols of the data blocks and the ECC blocks in columns (see col. 3 lines 64-66).

As per claims **17-25, 55-56, 59-63 and 66-69**, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including the system retrieves (read from the memory) the preliminary ECC symbols from the first storage location of each of the ECC blocks, schematically the symbols in the first column of the buffer rows assigned to the ECC blocks, and uses them to initialize an ECC encoder (see col. 31-39). Further, Rotker et al. teach that the system (10) receives blocks of data and stores the data in a buffer (13) whereby the buffer is schematically arranged as a matrix (array) with the data blocks stored in rows and further, the buffer includes 4 rows, schematically arranged beneath the data rows, for the storage of 4 multi-symbol ECC blocks (see col. 3, lines 59-64).

As per claims **26, 27, 57, 58, 64 and 65**, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including Rotker et al. in figure 1 element 12 (ECC encoder) encodes 16 data

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symbols to generate 4 ECC symbols and the 16 data symbols and the 4 ECC symbols together form a 20-symbol code word (see col. 3, lines 52-58 and col. 6, lines 10-15).

As per claims 28-31, Rotker et al. teach that the system (10) receives blocks of data and stores the data in a buffer (13) whereby the buffer is schematically arranged as a matrix (array) with the data blocks stored in rows and further, the buffer includes 4 rows, schematically arranged beneath the data rows, for the storage of 4 multi-symbol ECC blocks (see col. 3, lines 59-64).

As per claims 32-38 and 70-76, Rotker et al. teach all the subject matter claimed in claims 1 and 39 including Rotker et al. Each data block may be further encoded as it passes serially to the tape using an error detection code (CRC) wherein the CRC used to detect errors in the data blocks, and thus, determine which symbols in an interleaved code word, that is, which symbols in the data columns, are in error then the system can quickly correct the detected errors, which already have known locations in the interleaved code words (see col. 6, lines 16-28).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US PN: 5,966,389 Kiehl

US PN: 5,313,464 Reiff

9. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (703) 305-7743. The examiner can normally be reached on M-F 8-5.

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If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Esaw Abraham

Esaw Abraham

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Albert DeCady
SUPERVISORY PATENT EXAMINER
TELELOGY CENTER 2100